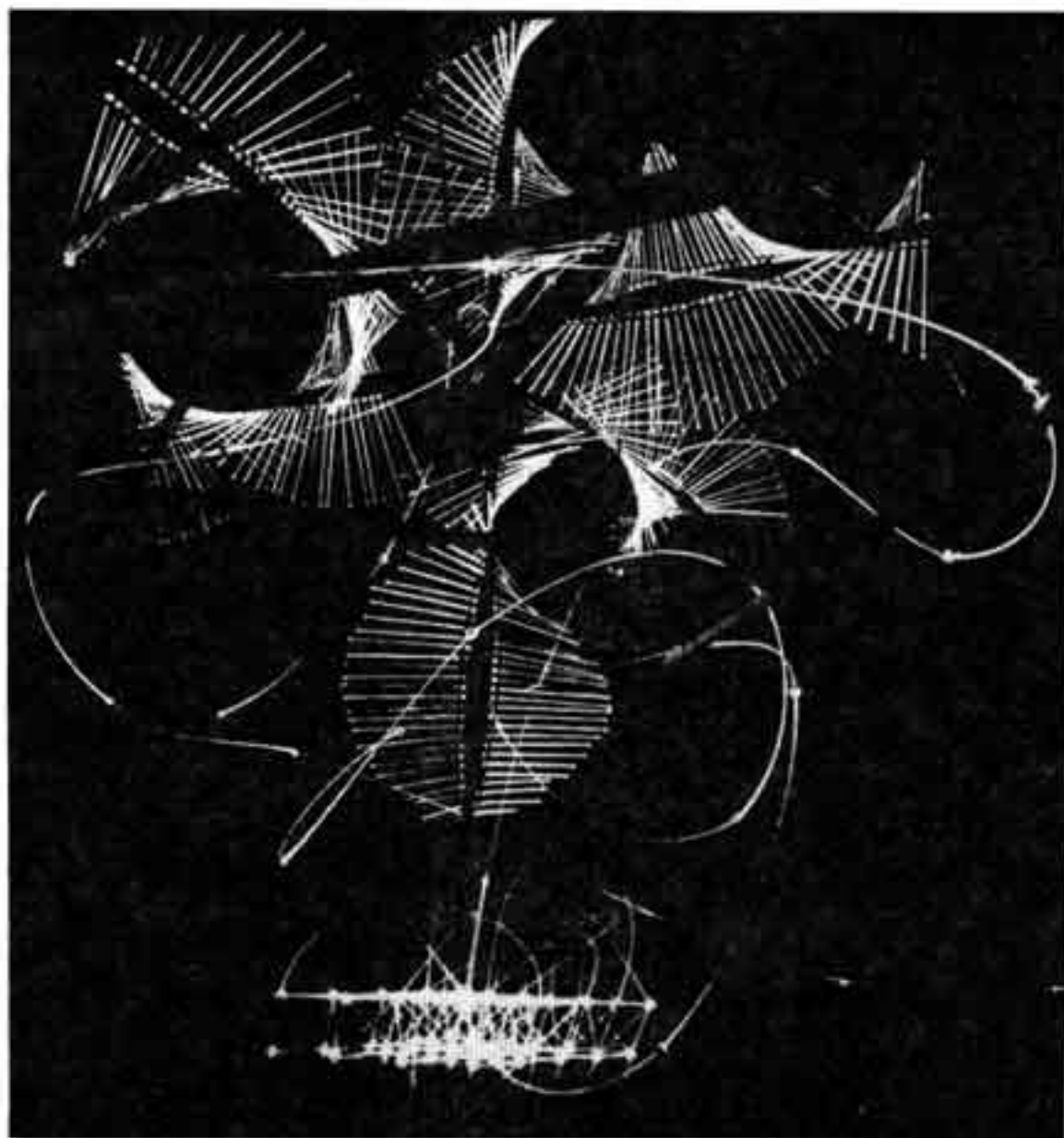


VIEW JOURNAL



ARTISTS USING SCIENCE AND TECHNOLOGY

NOTICE TO OUR READERS

Late in 1985 the Ylem Board of Directors decided to switch from publishing a bimonthly newsletter to instead, a monthly Calendar and a quarterly YLEM JOURNAL.

Your monthly Ylem Calendar will keep you informed of current events and opportunities, the Journal will provide in-depth reviews, articles, and profiles--particularly profiles of the work and thought of Ylem members.

If you are not yet a member, or haven't renewed, see the "About Ylem" notes and membership form on the back pages.

Best Wishes,

Fred Stitt, Editor

TABLE OF CONTENTS

LETTER TO THE EDITOR	3
By Walter Radtke	
UPWARD PROFILES.....	4
By Beverly Reiser	
ART, TECHNOLOGY AND INDUSTRY.....	8
By Ed Duin	
EM SQUARED.....	10
MEMETICS & THE MODULAR MIND.....	12
By Keith Henson	
YLEM SECOND NATIONAL MEETING.....	16
By Trudy Myrrh Reagan	
WHAT IS YLEM?.....	20
By Fred Stitt	

This journal is published quarterly and distributed to members of YLEM.

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Linda Torno, Associate Editor
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COVER ILLUSTRATION:

"PLUCKING THE TWANGER"
BY MILTON KOMISAR
Computer controlled light
sculpture

Contributions are most welcome. Drawings, graphic pieces, photos; explanations; submissions to Opportunities, Random Access, or Calendar; short book reviews or articles are also sought.

LETTERS TO THE EDITOR

Editor, Yiem Journal

It is essential that we begin to approach the subject of human intelligence with the object of creating some. Let me post a few observations on your Yiem article, "The Technology of the Brain, Part III."

First, we must decide on an understandable definition of Technology. If we say that technology is the discovery or invention of a new or amplified function for an apparatus or array of systems, then we have no way to account for the industrial revolution as a technological phenomenon. Cottage industry or artisanry was not merely amplified nor was iron's role only expanded. Paradigm shifts in energy throughput were achieved by fitting the machinery to the requirement and not vice versa. The implication here is that the creative imagination of the inventor/theorist was harnessed to the real world of economic production for the total field citizenry and not just for a specialized privileged elite. Technology was and is thus essentially democratizing and egalitarian. Your selection of 3 revolutionary processes could be faulted for their non-production of industrial wealth, i.e. their immeasurability in thermodynamic terms. The inventions you propose can conceivably detract from the creation and distribution of goods and services in that info access per se, unless it compels action more efficiently, is not technology, per se, it precedes it. A nation of yogis will not feed, clothe or house a pain-filled world. So let's, at the outset, say that technology is the harnessing of energy input for a more efficient output. Did you ever see that documentary on crackpot inventions called *Gyro*? How many old silent films of junior birdmen have we seen preceding the events at kitty hawk? What was the conceptualizing failure of those birdman inventors that was stepped around by the Wright brothers, for example? Why bicycle

makers? My guess is that the brothers from Dayton were able to harness a responsible, production-oriented, reality-oriented appreciation of prototype development coupled to an innate sense of energy throughput efficiency via the power-to-weight issues so tactilely apparent to the bicyclist. Energy in vs. energy out, or in the information game: info in/out/fo out.

My projection of the 3 seminal processes/inventions currently in potential for use are: 1) coherent waveform (laser) in industrial application for refining of metal alloys and other substances (plasma furnaces), cutting and shaping both macro- and microscopically, and fusing or joining of substances. This process like no other lends itself to robot workforce. Robotics does not mean chronic and massive unemployment, it means retraining and upgrading of human workforce skills, a greater intelligence level for all citizens. 2) parallel processing of computer data. I didn't mean to imply that info was not a crucial ingredient, but not only quantity, but speed, will be a factor in controlling industrial processes in intricate and self-regulating, semi-autonomous feedback loops. 3) fusion energy--it takes little imagination to see what a world with plentiful and cheap energy could provide its inhabitants. The geopolitics of raw material and commodity speculation has been the preeminent warmaking propellant among peoples and nations since history began. The greatest national resource is the mind of the citizen. This is why, today, much of modern warmaking potential is occurring within the realm of ideology and images. It's called low intensity warfare, and the recognition that the hearts and minds of the citizen are the strategic resource in question in the electronic age, is now inescapable.

I can see 3 social benefits deriving from the 3 industrial processes cited herein. 1) mass access to mass info

as in Dynabook and Xanadu will lift the intelligence and hence the expectation level (potential) of the citizen and will be invaluable for skill upgrading and intellectual fulfillment of a total field citizenry. 2) self-awareness schools will abandon mysticism and opt for the precise understanding of preconscious and unconscious psychological phenomena with the aim of freeing us once and forever from the stultifying effects of infantile and adolescent trauma and their attendant fixations and neuroses. Only then will mental faculties such as total recall, precognition and clairvoyance be made of use to everyone and be beyond the grasp of charlatans. 3) the strategies of nations must be deflected from the protection of boundaries and ideologies by war industry, onto the total field, geoinclusive strategy of space exploration and colonization. This is the only social dynamic that will support technological advancement and increase the standard of living of the world. What we currently enjoy in the way of electronic technology is a direct result (spinoff is a stupid characterization) of the cultural impetus for space exploration. Again the Wright brothers, power to weight equals miniturization, miniturization equals deconstruction (digitization), efficient energy throughput is again the key, only with miniturization comes increased rapidity of info throughput as well, a synergistic self-amplifying loop.

The questions we face about our destiny must be removed from the academician's realm of pure speculation and put on the surface of the 3-D world and there tested. Speculation is fun, but only for us. The rest of the world suffers and starves and waits for us to solve it. Stay tuned.

Walter Radtke



BY
Beverly Reiser

Since I consider it one of Ylem's imperatives to represent the artist's point of view, I decided to print the following statement by Lee Roy Champagne in its entirety. The accompanying photo is one of the "Altars" of "Chapel Champagne, Shrine of Latter-Day Neon Nuanced Naivete." While it is not one of the pieces described in the statement, it has the same general spirit.

I found the two works exhibited by Lee Roy at the "Hotel Project" (sponsored by Pro-Arts and San Francisco State University) to be among the most evocative I've seen in recent years. As I walked away I thought we should (as a culture) take care who and what we build our altars to--in the broadest possible sense.

A biography and statement by Lee Roy Champagne:

"Spectators spat on the piece, I received death threats and the work was unplugged, when my work *Chapel Champagne, Shrine of Latter-Day Neon Nuanced Naivete* was exhibited in the Three Rivers Arts Festival in Pittsburgh in June 1985. Earlier exhibits in Los Angeles, San Francisco, and New York had not evoked this response.

"*Chapel Champagne* is an 8-foot-high sheetmetal altar covered with mirrors and flashing orange, red and yellow neon lights. It includes a preacher's lectern holding a TV showing a series of atomic explosions. The piece is activated by kneeling before a coffin. At the top, in the middle of the keystone is an inverted pentagram. It is this pentagram which led some viewers to see the work as a shrine to Satan.

"The Festival director, on the other hand, said that the work had a very clear authoritative voice and spoke of the dilemma we all face living in the nuclear age. The co-curator called it a very moral piece and said that somehow the morality was being read wrong. She felt the piece was controversial and made people think--which is the function of art in general.

"One viewer said she especially liked the humor of the mousetraps holding trophies. Another said it opened his mind to new perspectives of art. Another loved it, said it grabbed her attention, but didn't understand it. One said it reminded him of *Star Wars*--thought it would ward off evil spirits.

"Historically the pentagram was the symbol for 'the inner light' until the 13th century, when French popes inverted it and declared it a symbol of Satan. The piece was not intended to desecrate religion. It's supposed to be a compassionate piece--like Dante's *Inferno* in a contemporary context--a statement about the self-destruction of nuclear war, not religion.

"*Kali, the Contemporary* is a similar piece--altarlike, a Kali figure surrounded by a mushroom cloud that lights up when a viewer kneels on the rail and inserts a coin. Below the altar is a little scene of army-men toys--reminiscent of kids' re-creations of war scenes.

"I attribute my esthetic perspective or lack of it to being raised in the urban environment of Detroit. There was no decoration other than the typical escapist, creature-comfort, commercial advertised art. Everyday

existence focused on the functional and its destruction. The drama and trauma of the human condition has dominated all of my drawing, painting and sculpture since I can remember. War art, robots, monsters were my icons--the wrathful deities, gods and demons of my youth. There was no escape from the dark and dirty hostile cradle which was called home sweet home. Out of the frypan of Detroit and after the fire of Vietnam, it was evident to me that Hell on earth was truly global and not just monopolized by the 'motor city.'

"But it took years of soul searching and research into comparative religion (which paralleled my university art education) for me to be able to digest these past life experiences and attempt to conclude why I do what I do. It seems to me that the driving energy which ignites my instructive fire feeds from the fuel of the intuitive truth. The illumination of the darkness of ignorance is the knowledge that decoration, imitation of nature or adornment of the physical is simple and base in comparison to the perception of the universe. Art which arose in human society as a magical religious operation, and passed over into a technique for depicting and commenting on secular reality, has in our time taken on a new function. A.R.T., Alternative Reality Time, today is a new kind of instrument for modifying consciousness or organizing new modes of sensibilities. Art as magic today serves its supreme function when it can lead the people into a new realm of consciousness. *Chapel Champagne* was designed to lead the senses, through contemplation, to a state beyond the senses."



"CHAPEL CHAMPAGNE, SHRINE OF LATTER-DAY NEON NUANCED NAIVETE"
BY LEE ROY CHAMPAGNE
One altar in the continuing series

VERNON REED BEYOND HARDWARE:

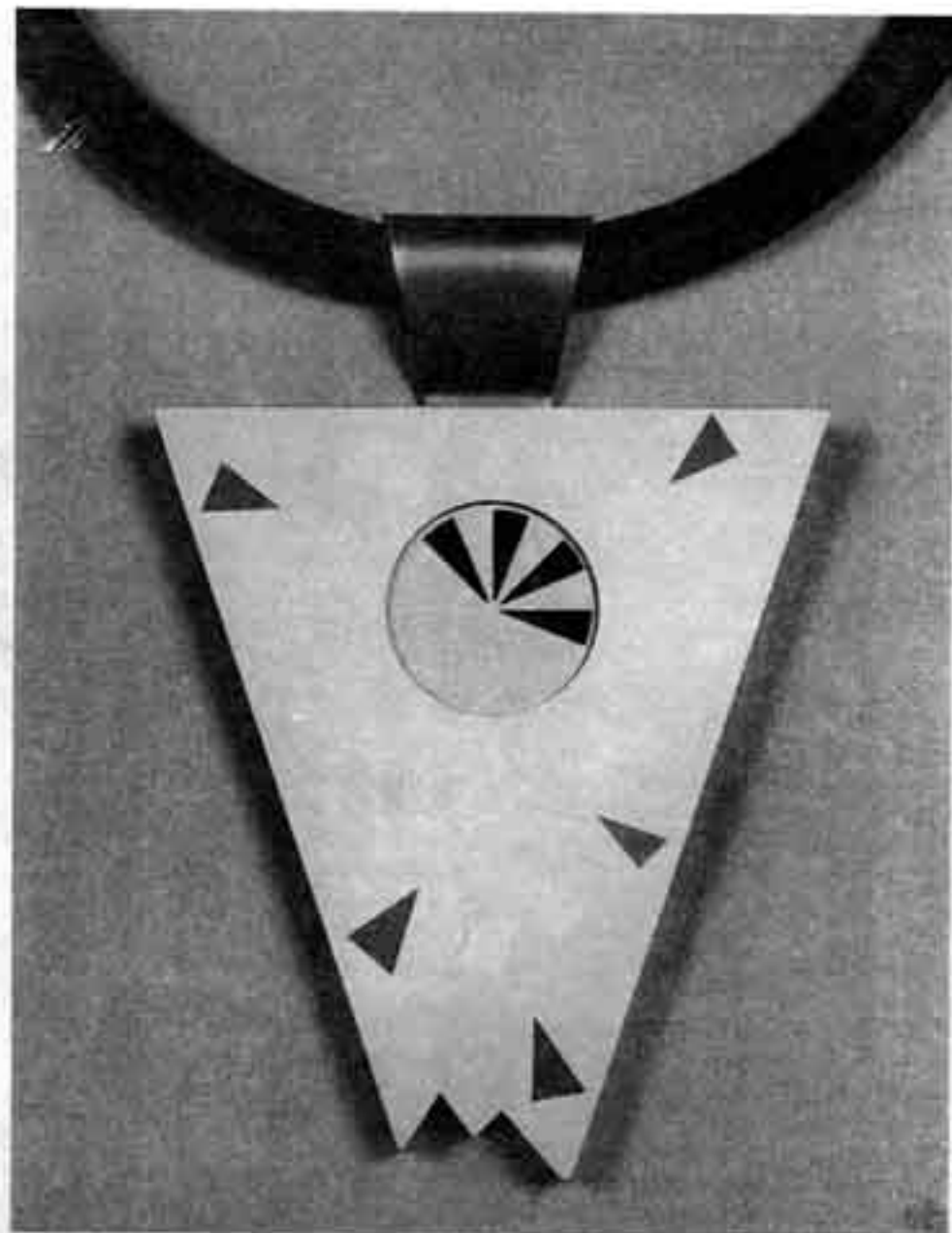
JEWELRY FOR A BRAVE NEW WORLD

It is Vernon Reed's belief that art and craft should reflect the nature of society. Our society is technology-based and information oriented and we can use this sensibility to create aesthetic entities impossible only a few years ago.

Cybernetic jewelry offers a unique approach to wearable art: the program is the jewel, and the hardware just makes it possible to wear the software.

"Cybernetic" is an adjective which refers to human control functions and the machine simulations of those functions, i.e. computers. Vernon uses it to refer to any system whose parameters are controlled by programmable computer logic. The nature of cybernetic jewelry allows some interesting questions to be asked about the nature of the aesthetic entity which defines the "jewel". Where does it lie? How can it be altered? From the earliest known examples until the present, jewelry has been identified with hardware of some sort, whether metal, plastic, or (lately) integrated circuits. The aesthetic entity of such a jewel is described by the configuration of that hardware and changing it requires the physical modification of some part of that hardware. The advent of the single-chip CMOS microcomputer with on-board non-volatile memory allows a new possibility, namely, "Cybernetic jewelry", in which a large part of the aesthetic entity is defined by a program running in the computer's internal memory and is outputted to an appropriate display device.

The ultimate goal of this scheme is something he calls "monitor Aesthetics" in which the physical aspect of the jewel has no more significance than a video monitor which is used to view computer

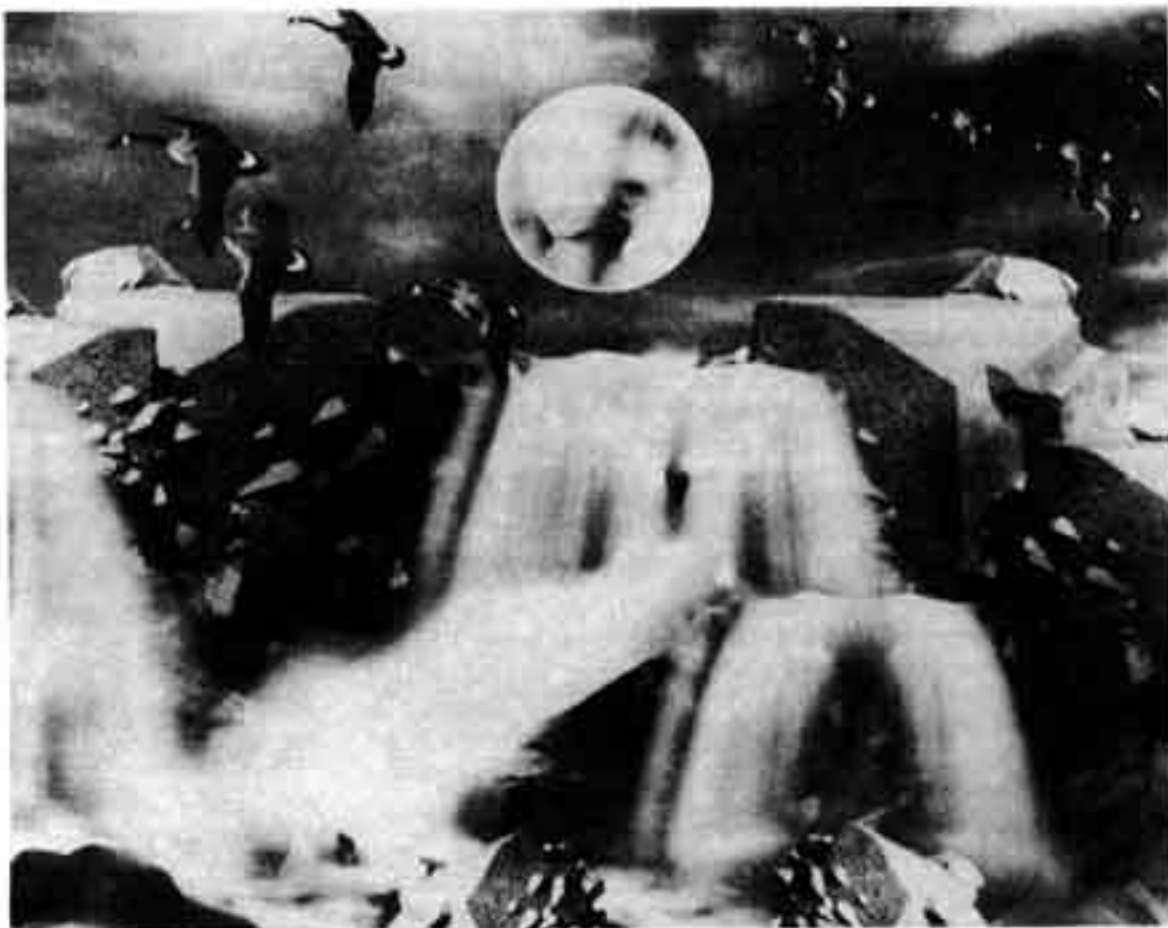


"COMET ZERO" BY VERNON REED
Cybernetic neckpiece

graphics. The entire aesthetic entity would reside in logical structures coded as binary numbers circulating through the computer's registers. This goal toward which he is working would be essentially digitally synthesized video adopted to the peculiar requirements of a wearable art form. Since the jewel in this case consists of numbers stored in the computer memory, changing the visual aspect of such a jewel requires no physical manipulation of hardware. It is only necessary to load a different

set of numerical instructions into the computer, or to branch to a different location in memory, and the aspect of the jewel will be as different as one chooses it to be. This is the quality of cybernetic jewelry that is truly revolutionary.

Vernon's concluding thought was that the same technologies which have taken us to new worlds (in space) can open the door to new worlds of aesthetic values and expressions. "The sky is no longer the limit, so go for it!"



COMPUTER GRAPHICS BY EDUARDO GUTEKUNST



"FLIGHT" BY JOSEPHA HAVEMAN

A QUICK LOOK AT A COMPLEX SUBJECT initial writing about ART TECHNOLOGY AND INDUSTRY

Explanation of the exhibition NEW DIMENSIONS OF ART 86

by Ed Duin

THE IMPERSONAL COMPUTER

It is relatively easy to write about aesthetic issues for an art-educated audience, to write about science for the scientist or to write about business matters for a specialized audience. As the following initial writing indicates, it is difficult, for example, to discuss aesthetic issues in a few words that are understandable and interesting outside the art world. The same is true of scientific and business issues.

Art technology and industry are each complex subjects. Just defining art or technology is difficult. A super-writer, an art and economic historian--art and social critic--sociologist and scientist--artist and philosopher, would be required to cover these subjects from all viewpoints in balanced, understandable writing. Since no individual super-writer exists, the method that will be used to communicate broadly will be to establish a comprehensive telecommunications network. Because computer ownership is not universal, I will operate this Impersonal Computer with a Living Bulletin Board System and will send and receive written and printed information by mail and when possible by telephone.

The combined writing, suggestions and other inputs from various sources will complete the project. Because specialists have reputations to maintain and may be uncomfortable when writing boldly their special world, inputs to this Impersonal Computer can be made anonymously. The established art critic who has not studied it may not want to offer comments about new technological art. Competitors, other art critics, may

be waiting to jump on any nuance of discourse outside the established art world view. The respected scientist, having a gut feeling about aesthetic issues, may not want to publicly proclaim artistic thoughts that might tarnish a scientific reputation. Many artists and businessmen do not write but are open to being interviewed. In each case the contributors should be able to enjoy the freedom of speaking "off the record."

There must be a starting point, something must be put on the line, and the following initial writing I have done will open topics for discussion. Those who have already expressed an interest or are actively interested in art and technology--artists, critics, writers, scientists and corporations--will receive a copy of this, and they are encouraged to respond by calling or by writing.

In this manner the Living Bulletin Board System will grow. All who participate will become a part of the network and will receive revisions of the documentation and a final copy of the combined information exchange.

COMPUTER TECHNOLOGY AND CULTURAL TRANSFORMATIONS

Computer technology is changing society. It is the most evident new technology except for nuclear technology; thus, the beginning focus will be on computers, computer art and the industrial companies that produce computer hardware and software. Terry Hansen, in the Editor's Note column of a local computer publication observes, "The liberal-arts folks," have been intimidated by technology. Hansen writes, "Science and technology offer a seductive picture of a simple world, a world that can be measured, described, predicted and managed. But the real world--as artists, philosophers and historians understand--is far more complex."

For scientists, engineers, and technologists to be like artists, philosophers, and historians requires challenging human transformations. Concomitant with the information and technological revolutions there have been wide changes in consciousness across a broad spectrum of culture. The need for this synthesis has been, for many years, a theme of modern philosophy. The complexity and extent of human knowledge, however, makes it extremely difficult for any individual to break beyond the bounds of specialization. There are also advantages to staying within a well-defined world of specialization where like-minded support and less risk is comfortable.

This renaissance requiring individuals to change will take a long time in comparison to the unrestrained growth of technology. Hopefully, small steps like this exhibition will allow individuals from the technological world and the "real world" to make connections and open their perspectives.

A vision of how management and corporations must change is expressed by Lawrence M. Miller in his "American Spirit, Visions of a New Corporate Culture," which ends with the following conclusion:

"Much of the civilized world is now in a period of adolescence, struggling to leave the selfishness of childhood but not having attained quite the maturity to accept the unpretentious partnerships of adulthood. The consequences of conflicts have escalated to unacceptable heights. The significant decisions are best made in a manner flattering to no one's ego. And few actions on the part of leaders are met with appreciation.

"The business institutions that produce the wealth of society, and upon whose shoulders rest the expectations of increasing goods and

services at decreasing costs, will be the vanguard in the effort to maximize the output and integration of human energy. The privately owned business organization has been in the past and will be in the future the first to experiment, sometimes failing but inevitably succeeding in its efforts to innovate and find the means of maximizing productivity. It is these institutions which will set the models that will be imitated by much of the world.

"We are now entering a period of transition as significant as the transition from an agricultural to an industrial society. Whether it is labeled the "information society" or given any other name, it will require a new set of management priorities and practices. The relationship between the employee, the organization and the manager will be remade. It will be a relationship built on trust and personal responsibility. It will require a new ethic and a new spirit. And in this new spirit we can all take pride, for it will represent the integration of the interests of the individual and those of the productive institution. The conditions that lead to personal fulfillment are becoming the same conditions that lead to corporate productivity. Personal responsibility, rewards for achievement, close relationships with respected peers, continual learning and involvement in decision making will all be characteristics of the organization of the future.

"An organization is much like a living organism. Its functions and structure are much like the body's. Its action may be either intelligent or stupid. Its adherence to a consistent set of beliefs, a 'good,' higher in scope and priority than any short-term decision or action, which exerts overriding influence on all actions, is its soul. In our secular society we have segmented our lives into matters concerned with material pursuit and matters of the spirit. We have even looked upon the pursuit of material

gain as inherently counter to the attainment of spiritual values. The poor and those who reject our wealth-producing institutions for ideological reasons are viewed as claimants to a more noble spirit. This is a false delusion. On the contrary, it is those who bear the burden of production, who are responsible for the creation of the wealth and permit the leisure and education our society allows, these are the ones who are making the noble contribution.

"Management is rediscovering its soul. America's best corporations and best managers are debating the values upon which their corporate cultures are built. They are recognizing the link between values, behavior and productivity. They are shaping their corporate cultures to elicit the best loyalties, creative energies and business performance possible. We are all fortunate to be living in an age in which this transition to maturity is being attained. For within this integration rest our best hopes for a society that serves both our material and spiritual needs."

THE ART WORLD VIEW

The main difficulty for many artists is to find opportunities to show their work. The problems today are confusing because of the diversity and profusion of contemporary art. The individual working with advanced technology is usually caught between two worlds--the product of his work does not find a place in the art world and there is not a direct application for the work for any obvious practical application such as a salable product.

The physicist-artist, for example, who works to create spectral light, visual effects using prisms and optical components does not produce a product. If there were a product, the physicist-artist would become an inventor and would go to an allied business to sell the idea; or, the physicist-artist would become an entrepreneur who would start a

company that would produce and market a new product.

Not taking the route of an inventor or entrepreneur, the physicist-artist's path may be to the art world. But then the difficulty is that there are few opportunities to show, and few opportunities to learn from the exposure and connections that result when art gets out of the studio.

David Bermant, an East Coast businessman, art collector and promoter of technological art, believes that this art is the most vital of our time. He has worked for many years examining the workings of the art world and has concluded that "placing emphasis upon science and technology and its resulting art forms is a mistake." He observes that "... few, if any, curators or directors want to become involved with an art movement or movements that appear to them as a resurrection of a failed movement or movements of the past."

If an artificially intelligent computer with a programmed brain of a poet and an ability to see multi-dimensionally responded to the curators and directors, the printout might be the elegy about art world mentality and high technology, *Composition for Techno-art Afflictionados*.

Historically, showing of vanguard art has been arranged by artists who worked together to create alternative exhibitions outside the established gallery and museum circles. New Dimensions of Art '86 will provide artists an opportunity to show their work, and the encouragement and exposure will be stimulating for the artists and other participants."

YLEM forum

December 14, 1985

By Grace Reim

The December 14 YLEM Forum at Santa Clara University featured the "bubble magic" of three Bay Area guest artists.

Ken Herrick, a University of California, Berkeley graduate and current Oakland resident, presented a sample for sculpture utilizing neon. Herrick has been drawing upon his training as an electronics engineer to make kinetic sculptures since 1969. Specializing in neon for the past 3 years, he describes himself as a "half-time" engineer, so that he might devote more time to his artistic interests. al phenomenon.

Herrick creates his visual affects by evacuating glass tubing of air, and refilling it with an appropriate rare gas. He explains that 3 factors will influence the colors yielded, including the type of gas, color of glass, and the inclusion of fluorescent phosphorus coating on the inside surface of the glass. His 1985 work features an 8'-tall neon columnar triad, standing on a black glass pyramid, itself outlined in neon. Passing viewers trigger the appearance of neon "bubbles" that rise or fall, then fade away.

Herrick's works have been on exhibition at the San Francisco Art Commission Show, the Civic Art Gallery in Walnut Creek, and the Berkeley Art Center. His kinetic sculptures include "Ahhh...So Delicious", a stream of neon "bubbles" pouring from a levitated pitcher into an eager mouth, and "Say What?"—four glowing neon "Nixie" tubes on curved columns delivering a silent monologue.

He is currently arranging for commercialization of the neon-bubble invention for which he has applied for U.S. Patent.

While "researching the new visual effects he'd be able to create in neon tubes," Herrick came across the

phenomenon of what he calls "neon bubbles." He found that initially he was unable to control the flow of the bubbles—"they drifted fleetingly, too rapidly to see." After approximately a week of additional experimentation, Herrick learned to control the phenomenon. This method of generation and control is the subject of his U.S. Patent. He is also trying to arrange for additional, world-wide coverage, that he might establish his method as a marketable, commercial

This artist has been creating sculptures for years that incorporate aspects of motion, sound, and light in art form. He hopes to "get back to designing more sculptures that may incorporate neon, but not feature it exclusively. It is simply a matter of finding the time to execute them."

Dr. Ilan Chabay, Palo Alto—an internationally known laser research scientist and chemist turned science education consultant—exhibited his "frozen bubbles" at the Forum. This relatively simple demonstration is nonetheless rich in scientific principals at all levels. When Chabay drops an ordinary soap bubble into an open, insulated box with dry ice on the bottom, it bounces on an invisible layer of carbon dioxide, which is denser than normal air. After the bubble mysteriously expands, it changes color, and then finally "freezes." It expands because it acts as a semi-permeable membrane, allowing the carbon dioxide to pass inside but not the other gases to escape. This is a model of the cell membranes in every living thing.

Chabay is interested "in the use of visual images as a vocabulary for thinking, that those images become the basis for forming conceptual models of our environment (in the most general sense of the word). I illustrate, with particular exhibits, the ways in which these ideas contribute to learning, and also the process with which I design them."

The artist's studies and

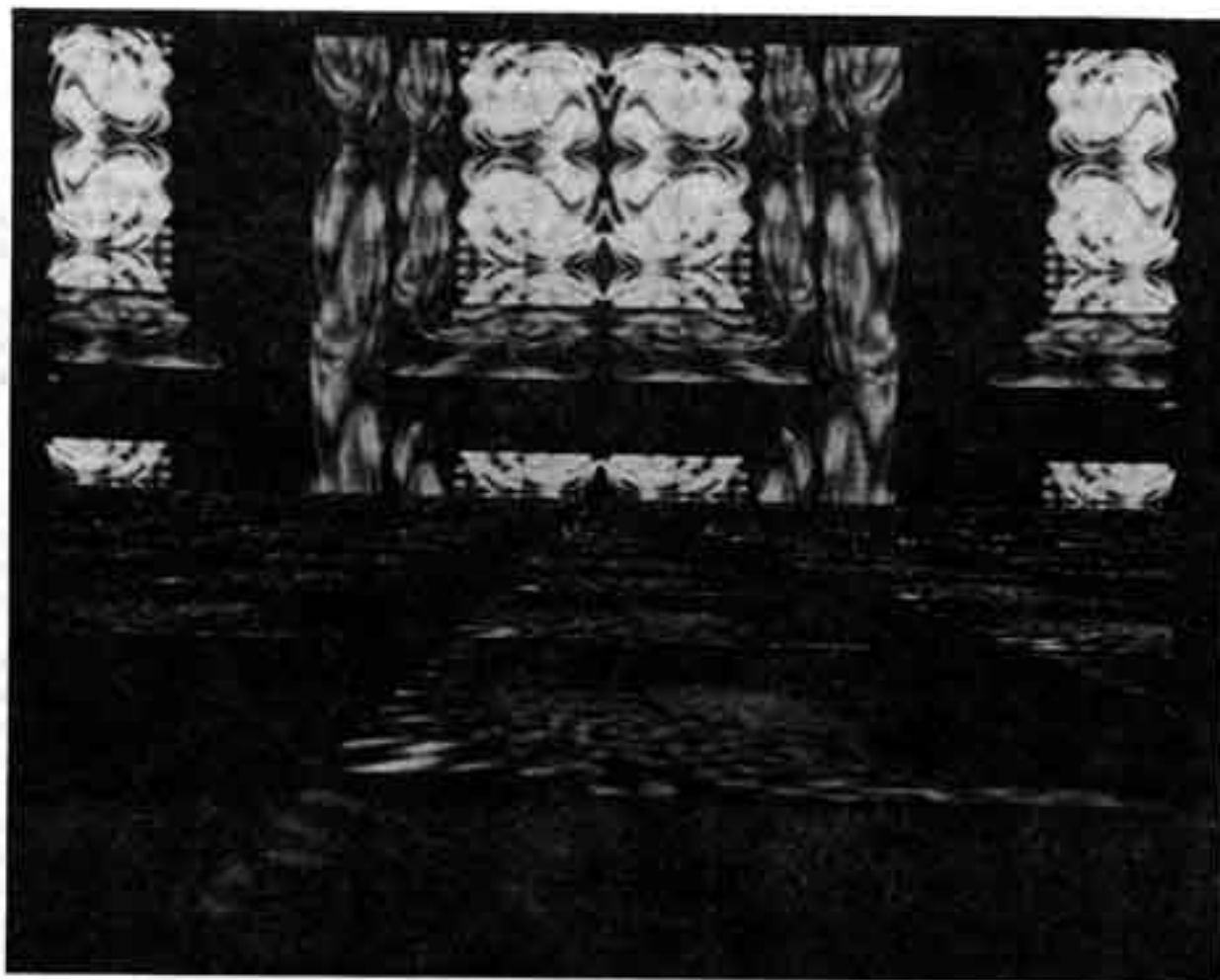
exhibitions have led him literally across the globe. After receiving his Ph.D. in chemical physics at the University of Chicago, he spent two years doing post-doctoral research in biophysical chemistry at the University of Illinois in Urbana. While employed by the National Bureau of Standards for 7 Years, he developed several significant new techniques for aerosol size measurement and for chemical analysis with lasers. In 1971, he spent 7 months lecturing at Japanese universities, and has published more than 30 papers in major scientific journals. He has lectured throughout the U.S. and in Europe, Japan, and Korea.

From June, 1982 through August, 1983, he was Associate Director of the Exploratorium in San Francisco, where he developed exhibits, wrote testimony on science education for the United States Congress, and coordinated communication with state agencies. As Consulting Associate Professor of Chemistry at Stanford University, he teaches physical and analytical chemistry, and is collaborating with Professor R.N. Zare on the development of a set of experiments, and on the use of lasers in chemistry.

Dr. Chabay is currently Director of the New Curiosity Shop in Palo Alto providing consulting services in creative science education. In 1984, Chabay conducted a 2-week long regional workshop on science education for teachers and students from nursery through high school, using activities involving hands-on exhibits he constructed during the workshop.

Tom Noddy doesn't classify himself as an artist. He explains that he is rather a performer, who demonstrates his vaudeville art as the substance of his act.

This 'performer' first became interested in 'bubbles' when he watched a college friend put smoke into bubbles. Full of ideas, he decided



"GABRIEL" BY DAVID EM

David Em was born in Los Angeles and spent his first years at an oil camp in the jungles of Columbia. After living in Venezuela and Argentina, he returned to the United States at age twelve. He studied painting and sculpture at America's oldest art school--The Pennsylvania Academy of the Fine Arts.

He produced his first digital image in January, 1975 at the Xerox Research Park in Palo Alto, California. In 1976 he gained access to more powerful computers, and in 1978 he started using computer programs written by Dr. Jim Blinn, of Cal Tech's Jet Propulsion Laboratory. These programs, which were written as fundamental research in the field of computer graphics, became the basis for

development and expression of Em's own creative vision. This computer graphics art work has been exhibited and published throughout the world.

Em terms his pictures "field notes" as he explores the evolution of his own artistic process. He claims incomplete understanding of the meaning and purpose of his images, and is frequently amazed by the diversity of response by those who see them. Stating that he now sculpts with "memory instead of space" and makes pictures with "light instead of paint," he maintains a multimedia approach to his work.

Currently Visiting Associate at the California Institute of Technology, Em divides his time between Sierra Madre, California, and northern New Mexico.

Memetics and the Modular Mind Modeling the Development of Social Movements

by Keith Henson

Science fiction writers do not always manage to stay ahead of science. One significant concept showed up in the scientific literature at least 15 years before Charles Sheffield and Arthur Clarke simultaneously wrote stories that incorporated the "Skyhook" or "Beanstalk". But in projecting a science of social prediction SF writers have been far ahead of the scientists. Isaac Asimov based the entire Foundation series on "Psychohistory". Robert Heinlein developed the theme of predicting social movements in his Future History stories, especially in Revolt in 2100, Methuselah's Children, and in the unwritten saga of Reverend Nehemiah Scudder. ("First Prophet," President of the United States, destroyer of its Constitution, and founder of the Theocracy. If this makes you vaguely uncomfortable, it is probably because you have been reading about preacher/presidential candidate Pat Robertson. As the Ayatollah recently demonstrated, fundamentalist religion and politics make a nasty mix.)

Science fiction aside, we don't have a science of social prediction. Until recently we haven't even had much in the way of theories. Our continual surprise at the development of cults, religions, wars, and similar social movements is a notable exception to the steady progress humans have made in building better models of our environment. When you consider the suffering associated with some social movements, our lack of good models must be considered a major deficiency.

A successful theory of the development of social movements will have to provide underlying causes for events that make up most of the evening news. It will have to discover common features that lie behind the diverse trends causing problems in Nicaragua, South Africa, Northern Ireland and the Middle East. It should be able to predict the conditions under which Turkey will be subverted by the same fundamentalist version of Islam that led to so much grief in Iran. It should provide a plausible model for the breakup of the Rajneesh cult, and evaluate the danger or lack of danger from the nutty LaRouche cult which has been getting so much media attention lately.

A tall order! But an emerging field of study, memetics, holds just such promise. Sometimes referred to as "the germ theory of ideas," it provides models where social movements are seen as side effects of infectious ideas that spread among people in a way mathematically similar to the way epidemic disease spreads. At a deeper level, research in neuroscience and artificial intelligence (AI) is starting to develop an understanding of why we are susceptible to "infectious information," both the benign and the deadly.

As useful as these models may be, they are not without the potential to seriously affect our cherished institutions. A good understanding of the mechanisms of our minds and the dynamics that underlie the spread and persistence of ANY social or political movement has the potential to forever alter the way we think about all other social movements, including those of our own culture, religions, and nation. Fortunately, when viewed from the perspective of tolerance that has

been developing in Western culture since the Renaissance, the changes in outlook seem to be positive.

Memetics comes from "meme," a word coined in purposeful analogy to gene by Richard Dawkins in his 1976 book, THE SELFISH GENE. In the last chapter, memes were defined as replicating information patterns that use minds to get themselves copied, much as a virus uses cells to get itself copied. (Dawkins credits several others for developing the concepts, especially the anthropologist T. F. Cloak). Being pure information, memes must be perceived indirectly, most often by their effect on behavior, or by material objects that result from behavior. Humans are not the only creatures that pass memes about. Bird songs that are learned (and subject to variation) and the songs of whales are also replicating information patterns that fit the model of a meme. So is the "termining" behavior that chimps pass from generation to generation.

Meme (which rhymes with cream) is a much wider concept than "idea." The important part of the "meme about memes" is that memes are subject to adaptive evolutionary forces very similar to those that select for genes. That is, they are subject to variation and selection in the environment provided by human minds, communication channels, and the vast collection of cooperating and competing memes that make up human culture. The analogy is remarkably close. For example, genes in cold viruses that cause sneezes by irritating noses spread themselves by this route to new hosts and become more common in the gene pool of a cold virus. Memes cause those they have successfully infected to spread the meme by both direct methods

(proselytizing) and indirect methods (writing). Such memes become more common in the culture pool.

This would be academic except that the survival of a meme is only loosely coupled to our own. Memes with lethal effect are well known. One need only remember back a few years to the People's Temple for a graphic example of what I call "memeoid" behavior. The Children's Crusades of the middle ages were larger and more lethal; only 2 of 20,000 returned from one. The mass suicide by the Jews at Masada is a clear example of learned information patterns in people's minds having more influence over their behavior than the fear of running off a cliff.

A more seductive example of a social movement set off by a lethal meme comes from South Africa. In the 1850's, a meme (originally derived from a dream) led to a great sacrifice by the Xhoas people during which they killed their cattle, burned their grain, and refrained from planting in the belief that doing so would cause their ancestors to come back from the dead and expel the whites. At least 20,000 starved when the predicted millennium of plenty failed to arrive. Known as the Cattle Killing, it was not a unique response for a primitive society's being displaced by a more technically advanced one. The "Ghost Dancers" among American Indians was a similar response.

As bad as the suicidal examples are, memes which induce one group of people to kill another are even worse. Although not widely taught in our schools, the social movement known as the Inquisition resulted in between 5 and 6 million people being burned as witches in Europe over a 300-year period that only ended in 1839. This was more than were killed in the wars of the same period, and was neither the first nor the last widely fatal variation stemming from religions or closely related social movements.

In recent times the people of Kampuchea were infested with an anti-intellectual utopian meme clearly mutated (in the minds of Pol Pot and his close associates) from communism. The resulting social

movement was a massive self-genocide. Over one third of the population of Kampuchea, including almost all of the city dwellers and the educated, died before the Vietnamese invaded and put a stop to the killing. How many more would have died had the social movement run its course is unknown. Kampuchea will certainly be a long time recovering.

People are more aware of the genocidal depredations resulting from the "master race" meme that was part of the Nazi meme complex. Considered from the viewpoint of memes, Hitler was less a prime mover than a willing victim of this particularly nasty and persuasive variation of information disease. A fascinating footnote to the German war experience happened in 1969 when a school teacher in Palo Alto exposed a high school class to an intensive, five-day experience with the ideas that made up the Nazi meme. The experience of that week was eventually made into a TV movie, *THE THIRD WAVE*. The enthusiasm with which the class adopted the memes and spread them to their friends made it one of the most frightening events the teacher had ever experienced. Given the track record of the Nazi meme, the mini-social movement his experiment set off is no more surprising than the medical effects would have been if the teacher had sprayed smallpox virus on the class.

The really interesting question about memes is why humans are sometimes susceptible to such "information diseases." The answers to such questions are starting to come from research in artificial intelligence (AI), neuroscience, and archeology. It is becoming apparent that our vulnerabilities are a direct consequence of the way our minds are organized, and the organization itself is a direct consequence of our evolutionary history.

Marvin Minsky (a principle founder of AI) and Michael Gazzaniga (one of the major workers in split brain research) both view minds as vast collections of interacting, largely parallel (co-conscious) modules or

"agents." The lowest level of such a society of agents consists of a small number of nerve cells that innervate a section of muscle. A few of the higher level modules have been isolated in clever experiments by Gazzaniga, some of them on split brain patients.

One surprise from this work is that we seem to have our mental modules arranged in a way that guarantees we will form beliefs. WHAT we believe in depends, at least in part, on what we are exposed to and the order in which we are exposed. Gazzaniga argues that we slowly evolved the ability to form beliefs because the ability provides a major advantage in surviving. Being able to infer, that is to form new beliefs, and learn such beliefs from others was a major advance over learning by trial and error. Being able to pass the rare new ways our ancestors found for chipping rock or making pots from generation to generation was vital in allowing humans to spread over the earth.

But as this ability became the norm, communicating human minds formed a new "primal soup" in which a new kind of non-biological evolution, that of replicating information patterns or memes, could get started. A wide variety of competing memes has evolved in the intervening seventy thousand years or so. It should not be surprising that the survivors of this process, like astrology or religions, are so well adapted to get their hosts to spread and defend them. It is also plausible that in the tens of millennia since memetic evolution became a major factor there has been a counter biological evolution. The parts of our brains that hold our belief systems have probably undergone biological adaptation to be less susceptible (that is more skeptical) to memes that result in death or seriously interfere with reproductive success.

This type of evolution/counter-evolution is known as an "arms race" to biologists. One such biological arms race has resulted in almost perfect egg mimicry by the cuckoo and in correspondingly sharp visual discrimination in the birds it parasitizes. By analogy, while we get

better at spotting dangerous memes, the memes may be evolving to be more effective at infecting us. Advancing technology (which itself is an improving collection of memes) changes the environmental conditions where memes survive or fail as well. The modern telephone system and the tape cassette player were major factors in the takeover of Iran. It has been argued that the rise of the Nazis depended on the development of modern communications.

I have picked dangerous examples for vivid illustrations, but most memes, like most microorganisms, are either helpful or at least harmless. Some, in fact, may even provide a certain amount of defense from the very harmful ones. It is the natural progression of parasites to become symbiotes, and the first symbiotic behavior that emerges is for a proto-symbiote to start protecting its host from other parasites. I have come to appreciate the common religions in this light. Regardless of how harmful they may be when they start, the ones that survive do not cause too much damage to their hosts. It is certainly safer to believe in a well aged religion than to be susceptible to a potentially fatal cult.

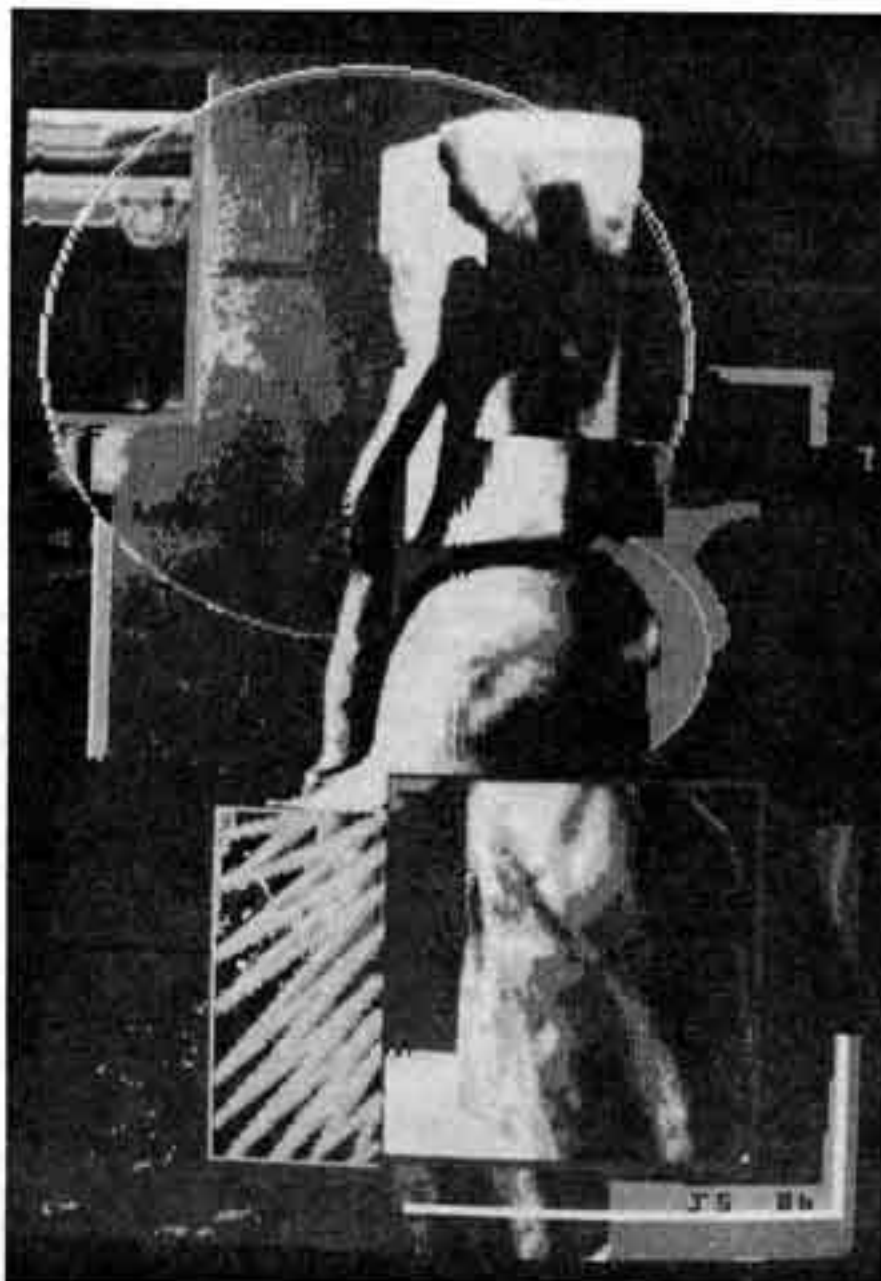
Memetics provides an interesting alternate way to view both history and the roots of current disputes. In this view, the ultimate (though unaware) protagonists of World War II were memes such as the Nazi "master race", and the Marxist-Leninist meme (MLM). The current clash between the Soviets and the western world can be viewed as a conflict for control of minds between the religion-like, competition-intolerant mono-meme of communism and the western meta-meme of tolerance which has been developing since the Renaissance. (While it is not a religion by any reasonable definition, the Marxist-Leninist meme is clearly in competition for the "belief space" in minds usually occupied by religious memes. It has the typical virtues and excesses of cult-stage religious memes).

Western culture itself may be

modeled as a vast ecosystem where memes engage in a "fair" competition with each other. Attempts to subvert fair competition by changing laws or education (such as introducing "creation science" into schools) draw opposition from defenders of a wide variety of memes which have evolved within this environment. Though I am engaging in pure speculation, this model may provide a testable explanation for both the tolerance within western culture of intolerant memes (such as creation science and the MLM) and the hostility these memes evoke from various segments of the culture. These thoughts on a memetic explanation for such particular ambiguities of our culture were prompted by reading David Brin's "Dogma of Otherness" in the April ANALOG.

Part of my interest in memes stems from a ten year (and continuing) experience of being infected with Gerrard O'Neill's space colony meme. (See "Memes, L5 and Religion of the Space Colonies," September, 1985, and "More on Memes," June 1986, both in L5 NEWS.) The space colony meme, and the organizations, such as the L5 Society, that are manifestations of it, have fallen on hard times. Memetics provides explanations for why the space colony meme spread in the first place, why it is having problems now, and some insight into what might be done to revitalize the meme and actually accomplish the implicit goals.

Even if it now provides some rough models to describe the origin and course of social movements, and some insight into the nature of meme competition, memetics is a long way from providing solutions to international problems, or predicting the course of troublesome social movements, or solving conflicts between social movements. But it does provide a formal analogy that encourages us to see if the models of ecosystems and epidemics that biologists have painstakingly developed fit well enough to serve as the basis for a new science that may accomplish some of these ends.



"MACEIO" BY JEFFREY SULLEY

Done on an Amiga computer using Deluxepaint

Work by JEFFREY SULLEY and LUZ BUENO was shown, through the month of August, at the Kaiser Center Art Gallery. It was called "The Art of Technology: Computer Images" and included several new works by each of them. Jeffrey's work is represented here by the photo titled "Maceio." For comments on Luz's work, please see the previous YLEM Journal.

SYNOPSIS, YLEM SECOND NATIONAL MEETING

JUNE 4, 1986 - LANEY COLLEGE

by Trudy Myrrh Reagan

For the first time in several years, the American Crafts Council held its national conference on the West Coast. Other groups with allied interests were invited to hold meetings near the conference. Ylem was pleased to be asked to hold one, for it afforded an opportunity to meet with some distant Ylem members, and learn about other craftspeople with a peculiarly Ylemish turn of mind. About half of the 60 people who attended ours sported crafts conference badges.

The site of the conference, the Oakland Museum, was covered with a garden of hanging plants, and to be in its gray insides gave one an underground feeling. Laney College next door, the site of the ancillary meetings, was a contrast: its geometric buildings presented a vista of red brick and cement, viewed from on high, since most foot traffic was on second-story walkways.

The meeting began by my introducing the work of more than a dozen Ylem artists whose work in materials was of particular interest to craftspeople. I used the slides members had sent us earlier. From neon and computer-assisted crafts to polyhedral glass windows and Indian beads, certain themes shone through that I associate with our group. One is lack of nostalgia. Electricity holds more allure than the materials and tasks of generations past. Even the 48 x 60 inch beaded piece by Eve King-Lehman incorporated electrical sound and light. Another is the new images, from sources unrelated to art history for images, as in Carrie Adell's "Solar Wind" necklace, or Joan

Michaels-Paque's topological fiberwork. Finally, a lack of respect for what machines were originally designed for, especially computers. How else did Luz Bueno's pixel image turn into a 8 x 12 foot rug mosaic? She was assisted by members of the Developmental Disabilities Service Organization in Sacramento.

I used slides of my own work to show how, without breaking stride, one could be a "fiberperson" in the 70's and a colleague of tech artists in the 80's. Always interested in patterns in nature, I had been drawing literal renditions of them in batik when I learned about shibori, a Japanese way of shaping fabric before dyeing to generate images. Similar to tie-dye but offering more precision, it allowed me to incorporate images I had drawn. Here I discovered the use of analogs in art: wrinkles in the cloth became the veins in my leaf designs. That was in 1978. Today, I am back to painting, but with a difference: I shape the paper before painting, and wrinkles become forms of the earth's crust, the forms so familiar to air travellers and geologists.

Nancy Gorglione's slides looked faint in the partly sunlit room, but she herself was dazzling. She seems to have explored light as a medium from a dozen different angles, most requiring collaboration and a mastery of a complex technology. Her work falls in at least three categories: first is the use of actual materials that transmit and reflect light. For instance, using a vacuum chamber, she coated glass with thin films to make dichroic glass. This has several strange properties. One in particular was exploited in a Tiffany lampshade she made with it. The viewer sees

one set of colors looking at the shade. The light coming through it produces the complement of each color. A fragment that appeared red would cast green onto the wall. Together, the two sets of colors made a rich effect.

Second, Gorglione and her colleagues Greg Cherry, Steve Anderson, and Steve Gill formed Laser Affiliates to organize multimedia performances and audience-participation happenings. These feature live music and eerily-lit dancers. Sometimes they are held in a theatre, where a poetic idea can be developed in sensory-overload. Laser images and other light show effects are superimposed on dance movement. Sometimes a mass of people marches to the sea with lights, or creates undulating movements to music with glowing chemo-luminescent vials concocted by Gill, while the darkness above is dispelled by animated laser images on low clouds.

Third, recent holography exploits by Gorglione include multicolor images with new, subtler shading, and animation. Many are abstract images whose forms seem to hover in impossible positions in space. Assemblages of 4-inch holograms are made into larger works that twinkle like a case full of topaz and emeralds as you walk by them.

Eleanor Kent's title, "Honey on the Xerox" proved to be literally true. In 1980 she adopted color Xerox as her medium. For two years, she gave it the upstairs bedroom, in front of the Victorian fireplace. After using it as a kind of instant photography for beautiful and oddball objects such as a pearly nautilus shell, Kent made an important discovery: how to Xerox



"HOMAGE TO LANDSAT" BY TRUDY MYRRH REAGAN
Digitized, colonized version of a section of a paper shibori

goo. Her neighbor, polyhedral window-maker Bruce Sherman, made her a shallow, transparent tray. By pouring viscous liquids into it she could play, yet keep the machine clean.

At the meeting Kent showed sequences of pictures from three honey sessions on the copier. She used a plastic squirt bottle to draw with honey, which had a most interesting line quality, dark in the center and illuminated at both edges. She revealed how she added more honey, played tricks with the color printing, and finally, mooshed the images with her hands. In another sequence, "Egg Murders", we saw how she combined sea shells with broken eggs. Mysteriously, these became a helmeted face. In the next picture, it disintegrated into abstraction again, just as faces form and dissolve in clouds. Toward the end of the session, the egg yolks partly coagulated, cooked by the machine's heat. Responding instinctively, playing, and above all, squishing and smearing are not activities we associate with machine use.

Cybernetic Jewels the size of large watch faces were shown to us by the Texas jeweller, Vernon Reed. These have black-and-grey liquid crystal diode (LCD) animation, framed in titanium frames with designs in metallic pastel colors. They are worn as pendants. The frames hold batteries, and are works of art in themselves, "mainly to dress up something that so far doesn't do a whole lot", said Reed modestly. Although we were wowed by the variety of effects in the moving geometric forms, controlled by a program burned into a microchip, his ultimate goal is "total video." (Shades of Dick Tracy).

1972 was the year that Reed heard of LCDs and realized their potential for jewelry. At that time they were an exotic laboratory curiosity, so he bided his time making wearable art out of other sorts of electronic light displays. Gradually, he acquired machinery for a small home lab. Some, like his machine for

polarizing LCD crystals, were home-built. Early experiments had a 95% rejection rate. Mid-level engineers in companies could sometimes get him access to labs where the chip designs that control the animation could be miniaturized. Now he is experimenting with several possible designs per "jewel," selected by a switch on the back. Next he hopes to use ROM chips that plug in the back that can be exchanged. "I'm no expert on LCD," he says, "I know exactly as much as I need to know to make my jewelry." Reed was also a speaker at the conference.

The presentation by Lee Roy Champagne began with a newscast covering the outrage over his piece at the Pittsburg, CA Courthouse art exhibit. "An inverted star in it.... Satanic symbol.... you kneel on a prayer bench to activate it!" The piece in question looked like a giant arch-shaped jukebox from the Black Forest, with blinking neon and other effects. Layers of images from religious and occult traditions were crowded together with references to modern life. The purpose of the kneeling rite? "I want people to see the whole sequence. Normally, people spend only a few seconds at each piece of art." False color images of his piece in various states prolonged our enjoyment of the piece for several minutes.

"Light is a symbol for me of education, spirit, being awake. I want to wake people up," said Champagne. His humor, sly and deadpan, is another mordant waker-upper. Another small piece recently shown was activated by pushing in the coin inserter (without money). Giddy sounds played while a little pink neon mushroom cloud lit up a Durer-like skeleton and nameless accretions.

At the studio of Yiem President Beverly Rieser, "a spot upon the earth to step into another dimension," visually speaking, has been created in her Neon Room. In it she can hang facing each other the neon and mirror wall pieces she has created, making a tunnel of infinite regress. These

pieces are about a yard square and four or five inches deep. The free-form shapes of mirror have a four inch border where the mirror has been sandblasted away. Still farther inside the border, hiding behind the mirrored surface, is a loop of neon that casts a glow onto the wall. (She has plastered the wall of the room with great lumps to catch this light). Rieser is a master of the calligraphic line that suggests movement, and each piece has one or more sandblasted into the mirror and repeated in diffused neon, as well as subtler ones blasted on the front face. Playful slides of these showed reflections of herself and a friend larking about into infinity.

She also showed a commission for architect Terry Schiller's home, ambiguously suggesting either the entrance to a Japanese garden or a home in the clouds, using many plaques of mirror and a touch of neon.

Ylem Membership Application

NAME _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE: DAYTIME _____ EVENING _____

If joining, please also complete the section below.

- ☐ to receive a sample issue
- ☐ \$20 year's membership
- ☐ \$15 student membership
- ☐ \$15 monthly calendar only
- U.S. Dollars only please

Ylem Membership Update

Dear Members,

We are in the process of updating our files on Ylem members. We need your help to make it possible for us to compile our "Yellow Pages." Please complete this page for us. Also if you have samples of your work, we would be very interested in seeing them.

NAME _____ ADDRESS _____

ARTISTIC MEDIA

Please mark 1 or 2. Beside each, please state in 26 letters your specialty. (i.e. : "illus. + images on cloth," "hi-res computer modeling," "bronze casting.")

- ___ conceptual art:
- ___ computer graphics/computer assisted art:
- ___ crafts:
- ___ exhibits/performance planning:
- ___ graphic design:
- ___ kinetic/interactive light or sound:
- ___ music:
- ___ 2-D fine arts (i.e. painting, printmaking, illustration, photography):
- ___ 3-D fine arts (i.e. sculpture, architecture):
- ___ video/film:
- ___ writing:
- ___ multi-media (hi-tech):
- ___ multi-media (not hi-tech)
- ___ other hi-tech
- ___ other

AREAS OF INTEREST: (Do not duplicate info. listed above.) Circle two.

- | | |
|-------------------------|--|
| ___ Aesthetics | ___ Natural Sciences: Biology, Geology, Botany |
| ___ Architecture | ___ Pattern and Structure |
| ___ Computer Graphics | ___ Perceptual phenomenon/Visualization |
| ___ Computer Science | ___ Psychology |
| ___ Education | ___ Physics, Chemistry |
| ___ Engineering | ___ Space, Astronomy, Cosmology |
| ___ Hi-tech Media | ___ Societies/Culture |
| ___ Mathematics/Puzzles | ___ Universe/Mind |

On an additional piece of paper please include what your artistic philosophy is (one paragraph only) and in what areas could technical assistance from Ylem members be useful in your work.

WHAT IS YLEM?

By Fred Stitt

Simple. "Ylem" is the primordial stuff from which the universe was created. (Pronounce it "Eye-lum" and you've got it.)

It's also a thriving organization of artists and art lovers who are enamored of science and technology.

That particularly means artists who work with video, ionized gases, computers, lasers, holograms, and other non-traditional media.

It also includes artists who use traditional media but who are inspired by the images, structures, and growth geometries of crystals, electromagnetic phenomenon, and biological self-replication.

The Ylem organization helps keep members informed of opportunities to show their work in upcoming exhibits, competitions, conferences,

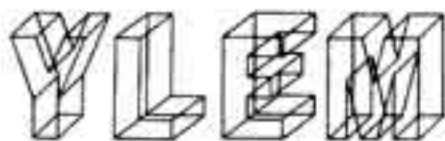
etc. It also publicizes and shows off members' work through its own publications and events. The active membership includes many well-known bay area figures in the arts and gallery world as well as collectors, educators, students, engineers, architects, and scientists.

Diverse techno-aesthetic interests are demonstrated quarterly at the YLEM FORUMS held alternately in San Francisco and on the Peninsula. They include presentations by practicing scientists who appreciate the aesthetic values within their disciplines and artists who enjoy the science and technology that underlies all art.

The Ylem Forums are hosted by Ylem founder Trudy Myrrh Reagan. Trudy almost single handedly nurtured and guided Ylem through the past few difficult formative years, providing a newsletter, field trips, expansive networking among hundreds of Ylem members, and the always amazing Forums.

Ylem also publishes a monthly Calendar - devoted to news of Forums, field trips, gallery openings, exhibits, presentations, parties, opportunities, and what-have-you.

Subscriptions to the Journal and the Calendar come with membership which costs \$20 per year (subscription only is \$15). You can join/subscribe or get a free sample of each by writing to Ylem, Box 749, Orinda, CA, 94563. Or for more information, call the President of Ylem, well-known glass and neon artist Beverly Reiser, (afternoons only) at (415) 482-2483.



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